California Power: Sparking Some Interest

What's the most expensive megawatt-hour (MWH) in the world? The one you needed, were willing and ready to purchase at the prevailing price, and yet could not obtain. This unfortunately describes the situation emerging in California at present.

Our task is not to assign blame; the history behind the present self-inflicted crisis is commonly accepted. What we can do here, however, is examine some of the more outlandish assertions and lawsuits flying about, in principal the ones stating that power marketers and traders are withholding natural gas and electricity from the state in a deliberate attempt to exacerbate the situation and drive the price higher.

Why certain segments of the polity require a conspiracy behind every adverse market movement is best left to the psychologists. We can demonstrate such actions to be economically irrational based on price relationships.

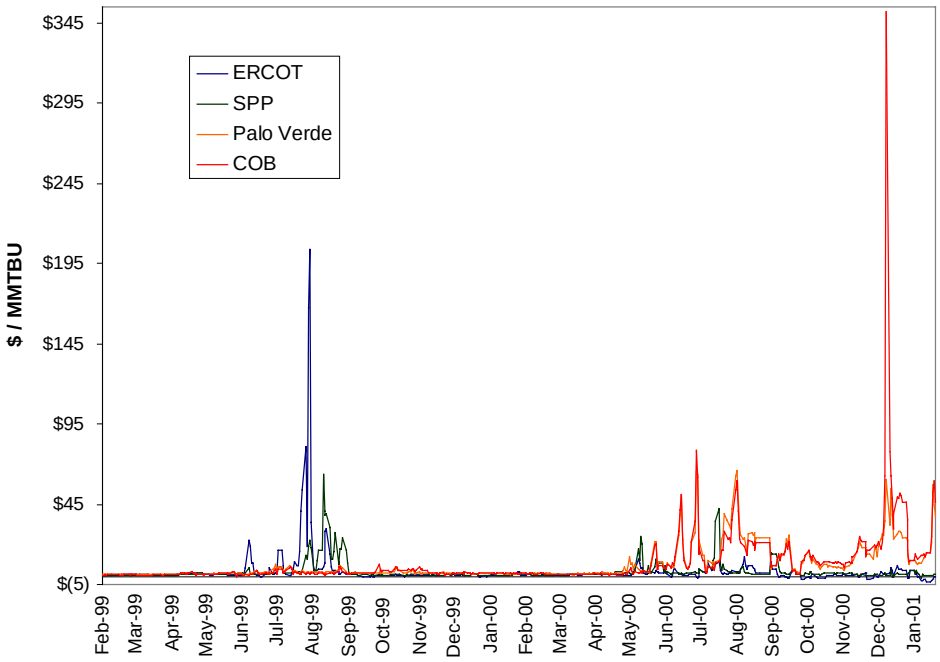
The Spark Spread

Incremental generation capacity in California and elsewhere increasingly is dependent on natural gas. The margin between the electricity produced in these plants is referred to as a "spark spread," and can expressed either as dollars per MWH or dollars per million British Thermal Units (MMBTU). The equivalence between $/MWH and $/MMBTU is determined by the generator's heat rate efficiency; the fewer BTU's are required to produce a MWH, the higher the efficiency. While the most advanced natural gas generators have a heat rate approaching 6,000 MMBTU/MWH, rates between 8,000 - 13,500 are more common.

Spark spreads are calculated as follows: Electricity ($/MWH) - gas price ($/MMBTU) * Heat Rate/1,000

The California market has two gateways, the Palo Verde switching station at the Arizona border and the switching station at the California/Oregon border (COB). We can be compare 7,500 heat rate spark spreads here to those within the Southern Power Pool (SPP, Oklahoma and Kansas) and southern Texas (ERCOT, the Electricity Reliability Council of Texas).

Comparative Spark Spreads: California And South Central



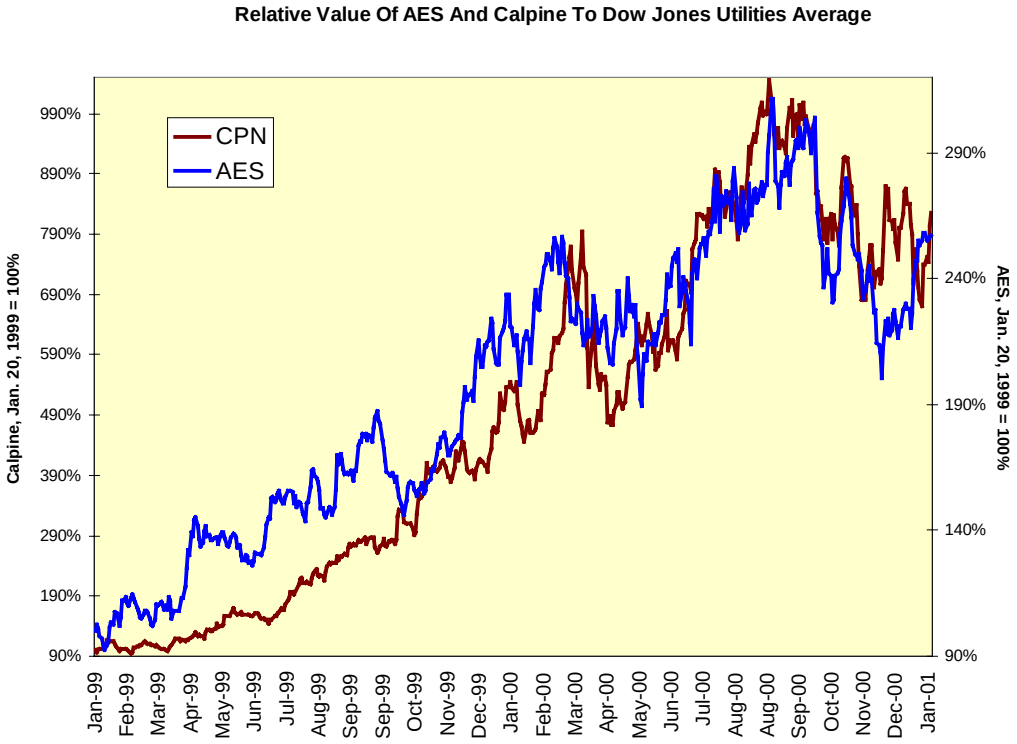
The range and explosive spikes of these spreads is impressive, and if they remind you of the distribution of returns on an out-of-the-money call option, this is not an accident. We can value incremental generation capacity a series of call options over time on the underlying spark spread. If the expected value of these calls exceed a long-term contractual price for electricity, then generator construction makes sense – with the provision the generator can capture the value of these calls in the power market.

At present, the spark spreads in the California markets are enormous even with natural gas prices almost four times the prices of a year ago, while those in the ERCOT and SPP markets are negative for 7,500 heat rate plants due to these same high natural gas prices. In a rational world, firms would be scrambling to sell power into the California market. Unfortunately, the botched regulatory regime in California threatens the ability of power generators to get paid both for the base price and for the spikes. This unhappy reality, and not any conspiracy, is preventing rational operators from tripping all over themselves to sell power in California.

Remove The Call, Remove The Power Plant

Smart regulators, which may be an oxymoron, should broadcast the potential to capture these calls to power plant builders in the hopes that new capacity would eliminate future price spikes. This everyone-tries-to-capture-the-same-upside behavior produces long-term price cycles in other industries, and it would have done so for California electricity. Independent power producers such as Calpine and AES would have built sufficient new capacity for the California market to ensure, in a self-defeating manner, that no future price spikes would occur. The recent price movements of Calpine and AES relative to the Dow Jones Utilities Average indicates their attractiveness as fallen as their ability to seek out and capture future price spikes in the California market has been threatened.

The logic is tough for regulators to grasp: When consumers pay more now, they are rewarded with new sources of supply. Years of lower prices and technological innovations follow as producers are forced to become ever more efficient in order to compete. This was the happy experience with natural gas decontrol up until 2000. The opposite is true as well: "Protect" consumers from higher prices, and years of shortage and inefficiency follow. This has been the universal experience of planned economies.



What About Futures?

Electricity futures at Palo Verde and COB were launched with much fanfare in the spring of 1996. They and a host of new contracts launched in 1998 have been abject failures, as predicted at the time by this author. While utilities manage their systems in the day-ahead market and with long-term fuel price contracts, the exchanges offered contracts for thirty-day blocks of power at a fixed price for the sixteen peak hours of daily demand. To make matters worse, the California experiment forbade utilities from hedging other than in the day-ahead market. The mismatch between the futures contracts and the industry's needs alone would have been fatal. Combined with a misunderstanding by many traders of the sort of volatility seen in the spark spread graph above and the inherent problems in trading a non-storable service such as electric power, swift relegation of electricity futures to the trash can of financial history was assured.

Since all energy markets ultimately are linked to electricity, and since energy prices have such a profound macroeconomic effect, it is necessary that we get this issue right. Political finger-pointing and lawsuits won't help. Free markets won't fail. Is this a tough choice to make?